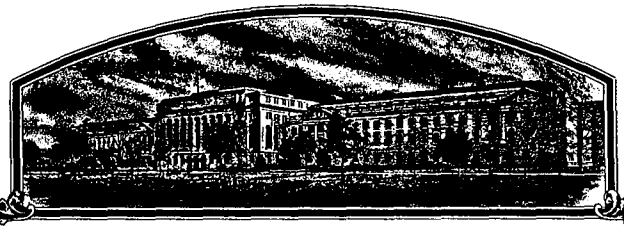


No. 8800195

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

DeKalb Plant Genetics

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF eighteen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT ETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT T. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN

'78551S'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington, D.C. *this* 31st *day of* August *in the year of our Lord one thousand nine hundred and* ninety.

Attest:

Kenneth A. Evans
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Clayton Yeutter
Secretary of Agriculture

APPROVAL EXPIRES 2-28-88

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

FORM APPROVED: OMB NO. 0581-0055

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

JMS 8/2/90

1. NAME OF APPLICANT(S): DEKALB ~~PFIZER~~ Plant GENETICS

2. TEMPORARY DESIGNATION: 78551S

3. VARIETY NAME: 78551S

4. ADDRESS *(Street and No. or R.F.D. No., City, State, and Zip Code)*: 3100 Sycamore Road, DeKalb, IL 60115

5. PHONE *(Include area code)*: (815)756-7333

FOR OFFICIAL USE ONLY

PVPO NUMBER: 8800195

6. GENUS AND SPECIES NAME: Zea Mays

7. FAMILY NAME *(Botanical)*: Gramineae

FILING: DATE July 5, 1988; TIME 9:30 ☑ A.M. ☐ P.M.

8. KIND NAME: Corn

9. DATE OF DETERMINATION: Winter 1986

FEES RECEIVED: AMOUNT FOR FILING $ 1800.00; DATE May 26 1988; AMOUNT FOR CERTIFICATE $ 280.00; DATE Aug. 22, 1990

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*: General Partnership

11. IF INCORPORATED, GIVE STATE OF INCORPORATION

12. DATE OF INCORPORATION

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS

JMS 5/3/90

~~Robert F. Sheyka~~ ~~C. Eric Christophersen~~ Robert E. Roman, Jr
~~Pfizer, Inc.~~ DeKalb-Pfizer Genetics Douglas A. Fisher ~~212/573-1189~~
~~235 East 42nd Street~~ 3100 Sycamore Road 815/758-9109
~~New York, NY 10017~~ DeKalb, IL 60115 PHONE *(Include area code)*:

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED

a. ☒ Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
b. ☒ Exhibit B, Novelty Statement.
c. ☒ Exhibit C, Objective Description of Variety *(Request form from Plant Variety Protection Office.)*
d. ☒ Exhibit D, Additional Description of Variety.
e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership.

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act.)* ☐ Yes *(If "Yes," answer items 16 and 17 below)* ☒ No

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? ☐ Yes ☒ No

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? ☐ Foundation ☐ Registered ☐ Certified

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.? ☐ Yes *(If "Yes," give date)* ☒ No

19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES? ☐ Yes *(If "Yes," give names of countries and dates)* ☒ No

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT: Thomas B. Rice — DATE 5/2/88

SIGNATURE OF APPLICANT — DATE

FORM LS-470 (3-86) *Edition of 7-84 obsolete.*

1

Exhibit A. Origin and Breeding History of the Variety.

ORIGIN AND BREEDING HISTORY OF DENT CORN INBRED 78551S

The dent corn inbred line 78551S was derived from the cross of two inbred lines 78060A and LH38. The original cross 78060A x LH38 was made by Dr. Thomas Bittinger, Owatonna, MN, in 1982. Seed of the S0 generation was sent to Hawaii by Dr. Bittinger and planted in the Winter 1982 nursery row no. 10,047. S1 generation seed was harvested and a sample of this seed was supplied to Dr. M. F. Lindsey, Dayton, IA, in 1983.

Summer 1983: S1 generation seed was planted at Dayton, IA. Twenty self pollinated ears were harvested, shelled separately and the S2 generation seed maintained separately (1983 Dayton nursery rows 2041-2050).

Summer 1984: S2 generation seed of ear number eighteen (of the 20 harvested) was planted at Dayton, IA. Seven self pollinated ears were harvested, shelled separately and the S3 generation seed maintained separately (1984 Dayton nursery row number 3072).

Winter 1984: S3 generation seed of ear number four (of the seven harvested) was planted at Homestead, FL. Three self pollinated ears were harvested and returned to Dayton, IA. Seed of each ear was shelled separately and the S4 generation seed maintained separately (1984 Winter nursery row number 1847).

Summer 1985: S4 generation seed of ear number one (of the three harvested) was planted at Dayton, IA. Four self pollinated ears were harvested, shelled separately and the S5 generation seed maintained separately (1985 Dayton nursery row number 2563).

Winter 1985: S5 generation seed of ear number one (of the four harvested) was planted in Homestead, FL, and the plants self pollinated. Eight ears were harvested and returned to Dayton, IA. Shelled seed of these eight ears was bulked and coded 78551S. (Winter nursery row number 893). The complete selfing pedigree for 78551S at the S5 generation was S5-18-4-1-1.

Exhibit A. Origin and Breeding History of the Variety.

Summer 1986
to Present: A pure source of 78551S has been maintained by self pollinating plants and bulking seed from selected ears.

Item 14 Exhibit A

STATEMENT OF STABILITY

Corn inbred 78551S was coded in 1985 and has been reproduced for the past 2 years by self-pollination. Inbred 78551S has been judged to be phenotypically and genetically stable.

STATEMENT OF UNIFORMITY

78551S is uniform for all traits observed.

EXHIBIT A
Appendum 2

The inbred 78060A, a parent line used in the development of inbred 78551S, is derived from the C103 family of inbreds. 78060A is an early C103, flowering approximately two days sooner than MO17HT, a C103 derived inbred line.

DEKALB-PFIZER GENETICS is the developer and sole and first owner of 78060A.

8800 195

EXHIBIT B.
Novelty Statement

78551S is a yellow dent corn inbred. The public line most closely related to 78551S is MO17HT.

78551S is significantly different from MO17HT for the following traits: heat units to 50% silk, ear leaf length, ear height, and ear weight (Table 1).

TABLE 1. Morphological traits that exhibit a significant difference between inbred and check (1987 DEKALB Inbred Test Data).

Trait	Mean		Difference in Means	s*	lsd**
	78551S	MO17HT			
Heat Units to 50% Silk	1473	1591	118	15.82	31.5
Ear Leaf Length (cm)	85	75	10	1.89	3.8
Ear Height (cm)	78	101	23	2.72	5.4
Ear Weight (gm)	148	85	63	7.90	15.7

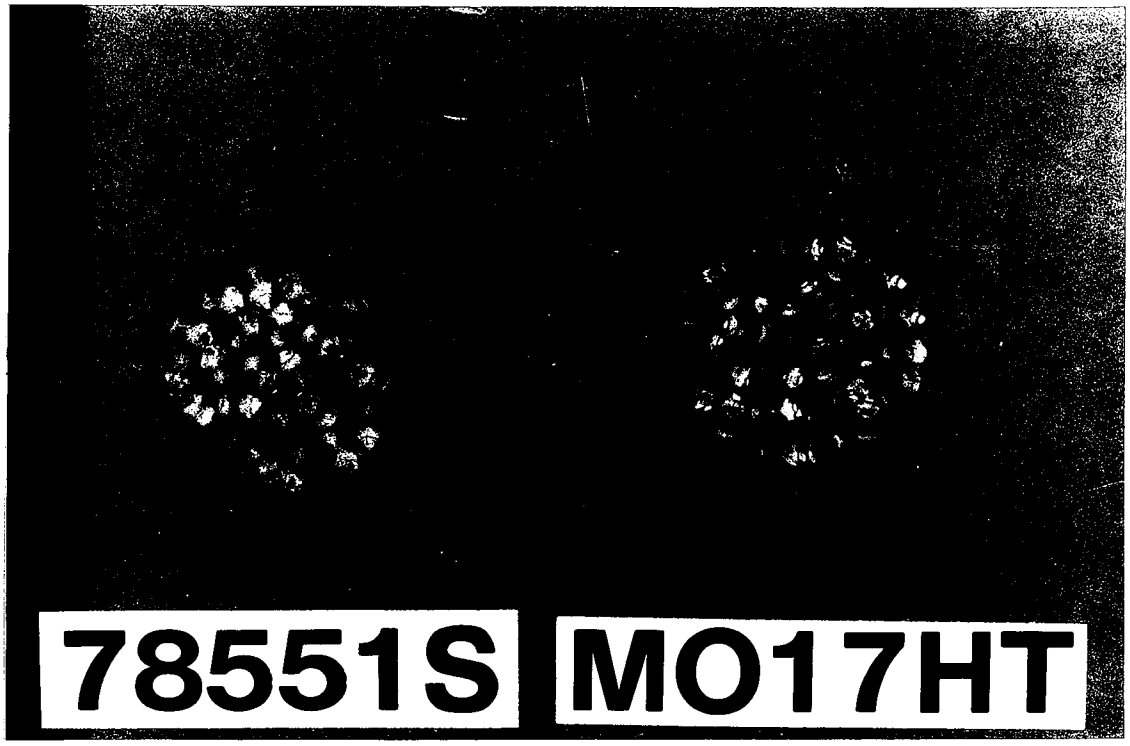
*s $= \sqrt{\text{error mean square}}$ (df = 97)

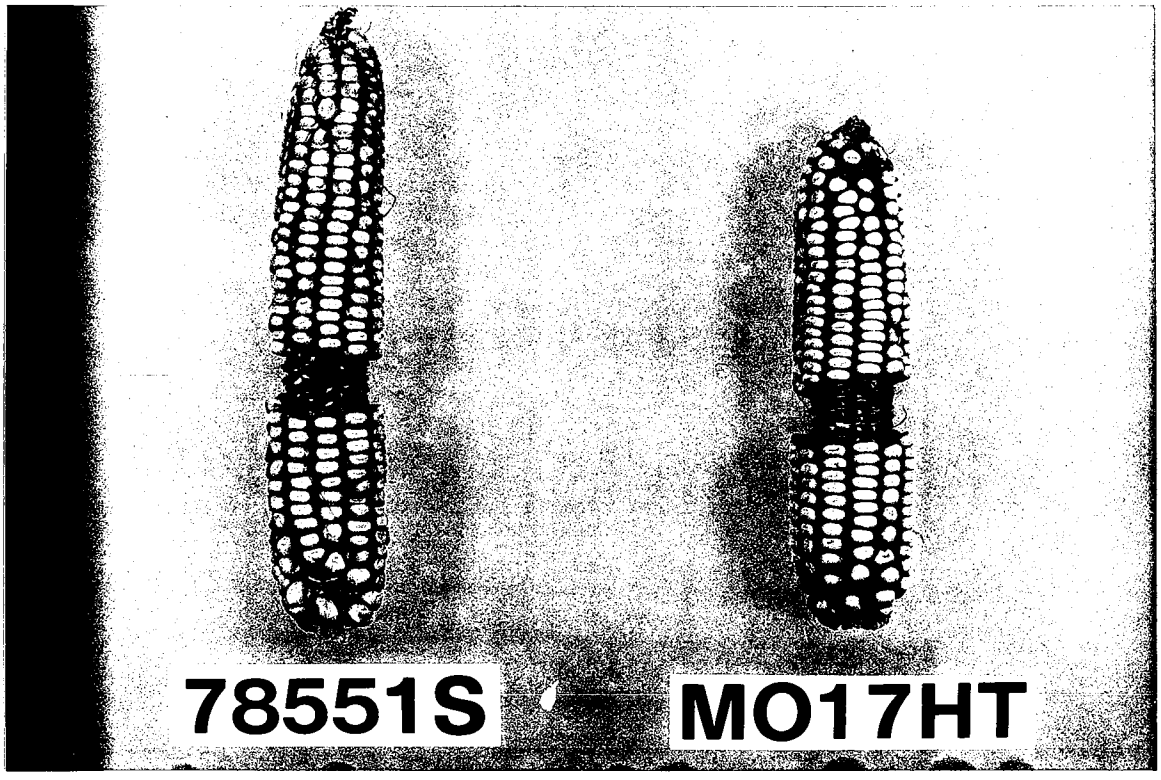
** Least significant difference based on Analysis of Variance at the 5% level of significance (98 entries and 2 replications).

lsd $= t_{.05/2}\, s\sqrt{2/r}$ ($r = 2$, $t_{.05/2} = 1.99$)

78551S

Exhibit B. Novelty Statement, Appendium II





FORM APPROVED. OMB NO. 40-R371

FORM GR-470-28
(2-15-74)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

EXHIBIT (
(Corn)

OBJECTIVE DESCRIPTION OF VARIETY
CORN *(ZEA MAYS)*

JMS 8/2/90

NAME OF APPLICANT(S)
DEKALB ~~PFIZER~~ PLANT GENETICS

ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*
3100 Sycamore Road
DeKalb, IL 60115

FOR OFFICIAL USE ONLY
PVPO NUMBER
8800195
VARIETY NAME OR TEMPORARY DESIGNATION
78551S

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. TYPE:

[2] 1 = SWEET 2 = DENT 3 = FLINT 4 = FLOUR 5 = POP 6 = ORNAMENTAL

2. REGION WHERE BEST ADAPTED IN THE U.S.A.:

[2] 1 = NORTHWEST 2 = NORTHCENTRAL 3 = NORTHEAST 4 = SOUTHEAST
5 = SOUTHCENTRAL 6 = SOUTHWEST 7 = MOST REGIONS

3. MATURITY (In Region of Best Adaptability):

(Under "omments" (pg. 3) state how heat units were calculated)

[7][8]	DAYS FROM EMERGENCE TO 50% OF PLANTS IN SILK	[1][4][7][3] HEAT UNITS
[ ][ ]	DAYS FROM 50% SILK TO OPTIMUM EDIBLE QUALITY	[ ][ ][ ][ ] HEAT UNITS
[5][6]	DAYS FROM 50% SILK TO HARVEST AT 25% KERNEL MOISTURE	[1][0][9][1] HEAT UNITS

4. PLANT:

[2][1][7] CM. HEIGHT (To tassel tip)

[ ][7][8] CM. EAR HEIGHT (To base of top ea

[1][6] CM. LENGTH OF TOP EAR INTERNODE

Number of Tillers:

[1] 1 = NONE 2 = 1–2 3 = 2–3 4 = > 3

Number of Ears Per Stalk:

[1] 1 = SINGLE 2 = SLIGHT TWO-EAR TENDENCY
3 = STRONG TWO-EAR TENDENCY 4 = THREE-EAR TENDENC

Cytoplasm Type:

[1] 1 = NORMAL 2 = "T" 3 = "S" 4 = "C" 5 = OTHER (Specify) _____

5. LEAF (Field Corn Inbred Examples Given):

Color:

[2] 1 = LIGHT GREEN (HY) 2 = MEDIUM GREEN (WF9) 3 = DARK GREEN (B14) 4 = VERY DARK GREEN (K1

Angle from Stalk (Upper half):

[1] 1 = < 30° 2 = 30–60° 3 = > 60°

Sheath Pubscence:

[1] 1 = LIGHT (W22) 2 = MEDIUM (WF9)
3 = HEAVY (OH26)

Marginal Waves:

[3] 1 = NONE (HY) 2 = FEW (WF9) 3 = MANY (OH7L)

Longitudinal Creases:

[1] 1 = ABSENT (OH51) 2 = FEW (OH56A)
3 = MANY (PA11)

Width:

[1][0] CM. WIDEST POINT OF EAR NODE LEAF

Length:

[ ][8][5] CM. EAR NODE LEAF

[1][9] NUMBER OF LEAVES PER MATURE PLANT

8

8800195

6. TASSEL:

[ ][5] NUMBER OF LATERAL BRANCHES

Branch Angle from Central Spike:

[2] 1 = < 30° 2 = 30–40° 3 = > 45°

Penduncle Length:

[ ][6] CM. FROM TOP LEAF TO BASAL BRANCHES

Pollen Shed:

[1] 1 = LIGHT (WF9) 2 = MEDIUM 3 = HEAVY(KY21)

[1] Anther Color:
[5] Glume Color:
1 = YELLOW 2 = PINK 3 = RED 4 = PURPLE 5 = GREEN
6 = OTHER (Specify) _____

Pollen Restoration for Cytoplasms (o = Not Tested, 1 = Partial, 2 = Good)

[ ] "T" [ ] "S" [ ] "C" [ ] OTHER (Specify Cytoplasm and degrees of restoration) _____

7. EAR (Husked Ear Data Except When Stated Otherwise):

[1][9] CM LENGTH [4][2] MM. MID-POINT DIAMETER 1 [4][8] GM. WEIGHT

Kernel Rows:

[2] 1 = INDISTINCT 2 = DISTINCT [1][2] NUMBER

[2] 1 = STRAIGHT 2 = SLIGHTLY CURVED 3 = SPIRAL

Silk Color (Exposed at Silking Stage):

[2] 1 = GREEN 2 = PINK 3 = SALMON 4 = RED

Husk Color:

[1] FRESH
[6] DRY
1 = LIGHT GREEN 2 = DARK GREEN 3 = PINK 4 = RED 5 = PURPLE 6 = BUFF

Husk Extention: (Harvest Stage)

[2] 1 = SHORT (Ears Exposed) 2 = MEDIUM (Barely Covering Ear) 3 = LONG (8–10CM Beyond Ear Tip) 4 = VERY LONG (> 10 CM)

Husk Leaf:

[1] 1 = SHORT (< 8 CM) 2 = MEDIUM (8–15 CM) 3 = LONG (> 15 CM)

Shank:

[1][5] CM LONG [9] NO. OF INTERNODES

Position at Dry Husk Stage:

[1] 1 = UPRIGHT 2 = HORIZONTAL 3 = PENDENT

Taper:

[2] 1 = SLIGHT 2 = AVERAGE 3 = EXTREME

Drying Time (Unhusked Ear):

[3] 1 = SLOW 2 = AVERAGE 3 = FAST

8. KERNEL (Dried):

Size (From Ear Mid-Point):

[1][1] MM LONG [ ][9] MM. WIDE [ ][5] MM. THICK

Shape Grade (% Rounds)

[3] 1 = < 20 2 = 20–40 3 = 40–60 4 = 60–80 5 = > 80

8800195

FORM GR-470-28

8. KERNEL (Dried) :

[1] Pericarp Color: 1 = COLORLESS 2 = RED-WHITE 3 = TAN 4 = BRONZE 5 = BROWN 6 = LIGHT RED 7 = CHERRY RED 8 = VARIEGATED (Describe) _____

[1] Aleurone Color: 1 = HOMOZYGOUS 2 = SEGREGATING (Describe) _____

[1] 1 = WHITE 2 = PINK 3 = TAN 4 = BROWN 5 = BRONZE 6 = RED 7 = PURPLE 8 = PALE PURPLE 9 = VARIEGATED (Describe) _____

[3] Endosperm Color: 1 = WHITE 2 = PALE YELLOW 3 = YELLOW 4 = PINK-ORANGE 5 = WHITE CAP.

Endosperm Type:

[3] 1 = SWEET (su1) 2 = EXTRA SWEET (sh2) 3 = NORMAL STARCH 4 = HIGH AMYLOSE STARCH 5 = WAXY STARCH 6 = HIGH PROTEIN 7 = HIGH LYSINE 8 = OTHER (Specify) _____

[3][0] GM. WEIGHT /100 SEEDS (Unsized Sample)

9. COB:

[2][2] MM. DIAMETER AT MID-POINT

Strength:

[2] 1 = WEAK 2 = STRONG

Color:

[3] 1 = WHITE 2 = PINK 3 = RED 4 = BROWN 5 = VARIEGATED 6 OTHER (Specify) _____

10. DISEASE RESISTANCE (0 = Not Tested, 1 = Susceptible, 2 = Resistant):

[0] STALK ROT (Diplodia)	[0] STALK ROT (Fusarium)	[0] STALK ROT (Gibberella)
[2] NORTHERN LEAF BLIGHT	[2] SOUTHERN LEAF BLIGHT	[0] SMUT
[0] SOUTHERN RUST	[0] CORN SMUT	[0] BACTERIAL WILT
[0] BACTERIAL LEAF BLIGHT	[0] MAIZE DWARF MOSAIC	[0] STUNT
[2] OTHER (Specify) Kabatiella zeae		

11. INSECT RESISTANCT (0 = Not Tested, 1 = Susceptible, 2 = Resistant):

[2] CORNBORER	[0] EARWORM	[0] SAPBEETLE	[0] APHID
[0] ROOTWORM (Northern)	[0] ROOTWORM (Western)		
[0] ROOTWORM (Southern)	[0] OTHER (Specify) _____		

12. VARIETIES MOST CLOSELY RESEMBLING THAT SUBMITTED FOR THE CHARACTERS GIVEN:

CHARACTER	VARIETY	CHARACTER	VARIETY
Maturity		Kernel Type	
Plant Type		Quality (Edible)	
Ear Type		Usage	

REFERENCES:

U.S. Department Agriculture. Yearbook 1937.

Corn: Culture, Processing, Products. 1970 Avi Publishing Company, Westport, Connecticut. (Numerous (Authors)

Emerson, R.A., G.W. Beadle, and A.C. Fraser. A Summary of Linkage Studies in Maize.Cornell A.E.S., Mem. 180. 1935.

The Mutants of Maize. 1968. Crop Science Society of America. Madison, Wisconsin.

Stringfield, G.H. Maize Inbred Lines of Ohio. Ohio A.E.S. Bul. 831. 1959.

Butler, D.R. 1954 – A System for the Classification of Corn Inbred Lines – PhD. Thesis, Ohio State University.

COMMENTS: Heat Unit Calculations:

$$GDU = \frac{\text{Daily Max Temp } (\leq 86F) + \text{Daily Min Temp } (\geq 50F)}{2} - 50F$$

10

Exhibit D. Additional Description of the Variety.

The isozyme analysis of 78551S and M017Ht shows genetic differences at five different loci: Acp1 - 3 vs. 2, Dia1 - 12 vs. 8, Glu1 - 7 vs. 6, Pgm2 - 4 vs. 8, Amp1 - 4 vs. 5. (See Exhibit D, Appendium I.)

Exhibit D, Appendium I. Additional Description of the Variety.

Isozyme Genotypes of Selected DEKALB Parents

	Alleles Present	
LOCUS	78551S	Mo17Ht
# of plants assayed	6	22
Acp1	3	2
Adh1	4	4
Amp1	4	5
Cat3	9	9
Dia1	12	8
Dia2	4	4
Enp1	6	6
Got3	4	4
Got2	4	4
Got1	4	4
Glu1	7	6
Hex2	2	2
Idh1	4	4
Idh2	4	4
Mdh1	6*	6*
Mdh2	6	6
Mdh3	16	16
Mdh4	12	12
Mdh5	12	12
Pgm1	9	9
Pgm2	4	8
Pgd1	3.8	3.8
Pgd2	5	5
Phi	4	4
Tpi1	4	4
Tpi2	4	4
Tpi3	4	4
Tpi4	4	4

*Allele is probably 6 but null cannot be ruled out.

Exhibit D, Appendium I. Additional Description of the Variety.

The technique of using isozymes for genotyping or "fingerprinting" is described by the following reference:

Goodman, M.M. and C. W. Stuber. 1980. Genetic identification of lines and crosses using isoenzyme electrophoresis. Proceedings of the Thirty-fifth Annual Corn and Sorghum Industry Research Conference.

Item 14 Exhibit E. Statement of Ownership

Applicant is the owner of the inbred. The inbred was developed by a breeder employed by the applicant.